

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1 to 5. (Canceled)

6. (Currently Amended) The method of performing an N-point radix-R Fast Fourier Transform in a data processing apparatus having a data cache comprising the steps of:

comparing the data set of input data and twiddle factors with the size of the data cache;

if said data set is smaller than said data cache, performing said Fast Fourier Transform in  $\log_2 N$  stages on all the data set in one pass; and

if said data set is larger than said data cache but smaller than R times the data cache

dividing said input data into R continuous data sets where each of said R continuous data sets fit within the data cache;

disposing said input data into memory, each R continuous data set in continuous memory locations with a space in memory locations from an end of one continuous data set to a beginning of a next continuous data set equal to the size of a cache line;

separately and independently performing a first stage radix-R butterfly computations on all the ~~the~~ R continuous data sets thereby producing R independent intermediate data sets in a first pass each of which fits within the data cache; and

successively performing second and all subsequent stage butterfly computations on each independent intermediate data

26 set in turn producing corresponding output data in second  
27 passes.

1 7. (Original) The method of claim 6, wherein:  
2 said Fast Fourier Transform uses complex input data and  
3 complex twiddle factors of M bytes each; and  
4 said step of comparing the data set with the size of the data  
5 cache compares the data cache size to  $4 \times M$  bytes.

1 8. (Original) The method of claim 6, wherein:  
2 said radix-R is radix-2.

1 9. (Original) The method of claim 6, wherein:  
2 said radix-R is radix-4.

10. (Canceled)

1 11. (Original) The method of claim 6, further comprising:  
2 if said data set is larger than R times the data cache  
3 performing I initial stages of radix-R butterfly  
4 computations on all the input data producing R independent  
5 intermediate data sets, where I is the next integer greater  
6 than  $\log_R(D/C)$ , D is the size of the data set and C is the  
7 size of the cache; and  
8 successively performing all subsequent stage butterfly  
9 computations on each independent intermediate data set in turn  
10 producing corresponding output data in second passes.